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REMARKS

Claims 1 to 16 are pending in the present application. Claims 1, 5, 6, 8, 9, 11, 12, 15 and 16 have been amended herein. Upon entry of the amendment, claims 1 to 16 will remain under examination.

Regarding the amendments

Claims 1 and 6 have been amended to indicate that a phosphodiester bond is formed between the polynucleotide-3' phosphorothiolate and the acceptor polynucleotide, whereby a ligated nucleic acid product is generated. Claim 6 also has been amended to indicate that the polynucleotide-3' phosphorothiolate precursor reacts with the iodonitrobenzene to produce the polynucleotide-3' phosphorothiolate. Claims 8 and 11 have been amended to recite in the preamble a method of ligating a vector and an insert, and to indicate that a phosphodiester bond is formed between the insert and acceptor vector, whereby a ligated product vector containing the insert is generated. Claim 11 has also been amended to indicate that the polynucleotide-3' phosphorothiolate precursor reacts with the iodonitrobenzene to produce the polynucleotide-3' phosphorothiolate. Claim 9 has been amended to recite the phrase "said insert" to be consistent with the language of claim 8 as amended. Claims 12 and 16 have been amended to recite in the preamble a method of ligating a vector and a polynucleotide, and to indicate that a phosphodiester bond is formed between the vector and the acceptor polynucleotide. Claim 16 has also been amended to indicate that the polynucleotide-3' phosphorothiolate precursor reacts with the iodonitrobenzene to produce the polynucleotide-3' phosphorothiolate. These amendments to claims 1, 6, 8, 9, 11, 12 and 16 were made to merely state the result of the steps practiced and therefore add no new matter.

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Claim 5 has been amended to indicate that a polynucleotide product is generated when a phosphodiester bond is formed between the polynucleotide-3' phosphorothiolate and the acceptor polynucleotide, that either the polynucleotide-3' phosphorothiolate or the acceptor polynucleotide comprises a vector, and that the ligated nucleic acid product is replicated in the host cell. Support for these amendments to claim 5 can be found throughout the specification, for example, at page 24, lines 12-16, which indicates that a vector can be replicated in a host cell; and by claims 8 and 12 as originally filed.

Claim 15 has been amended to further clarify that the 3' phosphorothiolate moiety is present at one or more ends of the vector. This amendment is a grammatical change and therefore adds no new matter.

As set forth above, the amendments are fully supported by the specification and claims as originally filed and do not introduce new matter. Accordingly, entry of the amendments is respectfully requested.

Regarding the claim objection

The Office Action states that claim 15 is objected to for reciting the phrase "at one or more terminal ends." Applicants maintain that claim 15 as originally written is clear because it would be understood by one skilled in the art that the phrase "at one or more terminal ends" refers to the ends of the vector. Nevertheless, to further prosecution, claim 15 has been amended to recite the phrase "at one or more ends of said vector." In view of this amendment to claim 15, Applicants request removal of this claim objection.

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Regarding the indefiniteness rejections

The rejection of claims 1 to 4 and 6 to 16 under 35 U.S.C. § 112, second paragraph, as allegedly indefinite are respectfully traversed. Applicants submit that claims 1 to 4 and 6 to 16 are clear and definite as written.

Claim 1 stands rejected as indefinite for lacking a ligation step. As amended, claim 1 recites that a phosphodiester bond is formed between the polynucleotide-3' phosphorothiolate and the acceptor polynucleotide, whereby a ligated nucleic acid product is generated. Therefore, claim 1 recites ligation of the polynucleotide-3' phosphorothiolate and the acceptor polynucleotide. Accordingly, Applicants submit that claim 1 as amended is clear and definite.

Claim 5 stands rejected as indefinite for allegedly lacking correlation between the last method step and goal of the method. As amended, claim 5 is directed to a method of replicating a ligated nucleic acid product. Applicants respectfully submit that the recited method steps correspond to the goal of the method, and that claim 5 as amended is therefore clear and definite.

Claim 6 stands rejected as indefinite for allegedly (1) lacking a step for producing a polynucleotide-3' phosphorothiolate; (2) lacking a step for generating a vector; and (3) lacking a non-enzymatic ligation step. Regarding (1), claim 6 as amended recites that the polynucleotide-3' phosphorothiolate is produced when the polynucleotide-3' phosphorothiolate precursor reacts with the iodinitrobenzene, and therefore recites a step for producing the polynucleotide-3' phosphorothiolate. Regarding (2) and (3),

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Applicants respectfully point out that claim 6 does not recite generating a vector, but instead recites generating a ligated nucleic acid product. In addition, amended claim 6 recites that a phosphodiester bond is formed between the polynucleotide-3' phosphorothiolate and the acceptor polynucleotide, whereby a ligated nucleic acid product is generated, and therefore contains a step for generating a ligated nucleic acid product, which is a non-enzymatic ligation step. In view of the amendments to claim 6, Applicants submit that claim 6 as amended is clear and definite.

Claim 8 stands rejected as indefinite for allegedly lacking a step for producing a vector and for reciting the phrase "an insert polynucleotide." As amended, claim 8 recites that the a phosphodiester bond is formed between the insert and the acceptor vector, whereby a ligated product vector containing the insert is generated. In addition, claim 8 has been amended to recite "said insert" rather than "an insert polynucleotide." In view of the amendments to claim 8, Applicants submit that this claim is clear and definite.

Claim 9 stands rejected as allegedly unclear for reciting "an insert polynucleotide." Applicants maintain that claim 9 is clear as written. Nevertheless, as amended, claim 9 recites "said insert" to be consistent with claim 8, as amended.

Claim 11 stands rejected as indefinite for allegedly (a) lacking a step for molecular cloning; (b) lacking a step for forming the polynucleotide-3' phosphorothiolate; (c) lacking a step for generating a vector and (d) reciting the phrase "an insert polynucleotide." Regarding (a), claim 11 as amended is directed to a method of ligating a vector and an insert. Regarding (b), claim 11 as amended recites that the polynucleotide-3' phosphorothiolate precursor reacts with the

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iodonitrobenzene to produce a polynucleotide-3' phosphorothiolate. Regarding (c), claim 11 as amended recites that a phosphodiester bond is formed between the polynucleotide-3' phosphorothiolate and the acceptor polynucleotide whereby a ligated product vector containing the insert is generated. Regarding (d), claim 11 has been amended to recite "said insert" rather than "an insert polynucleotide." In view of the amendments to claim 11, Applicants submit that this claim is clear and definite.

Claim 12 stands rejected as indefinite for allegedly (a) lacking a step for molecular cloning; (b) lacking a step for generating a vector and (c) being unclear as to whether a vector comprising the acceptor polynucleotide has the polynucleotide-3' phosphorothiolate or not. Regarding (a), claim 12 as amended is directed to a method of ligating a vector and a polynucleotide. Regarding (b), claim 12 as amended recites that a phosphodiester bond is formed between the vector and the acceptor polynucleotide whereby a ligated product vector containing the polynucleotide is generated. Regarding (c), claim 12 has been amended to recite a "ligated product vector comprising said polynucleotide." In view of the amendments to claim 12, Applicants submit that this claim is clear and definite.

Claim 15 stands rejected for reciting the phrase "one or more terminal ends." In this regard, it is alleged that the vector recited in claims 12 and 15 could be circular and thus have no terminal end. Applicants respectfully point out that a vector containing polynucleotide-3' phosphorothiolate moiety has at least one terminal end, the end on which the polynucleotide-3' phosphorothiolate moiety is present, as is shown, for example, in the specification on page 10, lines 6-17. For this reason, Applicants submit that claim 15 is clear and definite.

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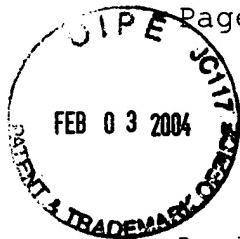
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Claim 16 stands rejected as indefinite for allegedly (a) lacking a step for forming a polynucleotide-3' phosphorothiolate; (b) lacking a step for generating a vector; and (c) being unclear as to whether a vector comprising the acceptor polynucleotide has the polynucleotide-3' phosphorothiolate or not. Regarding (a), claim 16 as amended recites that the phosphorothiolate precursor reacts with the iodonitrobenzene to produce a polynucleotide-3' phosphorothiolate. Regarding (b), claim 16 as amended recites that a phosphodiester bond is formed between the vector and the acceptor polynucleotide whereby a ligated product vector containing the polynucleotide is generated. Regarding (c), claim 16 has been amended to recite a "ligated product vector comprising said polynucleotide." In view of the amendments to claim 16, Applicants submit that this claim is clear and definite.

In view of the above amendments and remarks, Applicants respectfully request removal of the rejection of claims 1 to 4 and 6 to 16 under 35 U.S.C. § 112, second paragraph.

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CONCLUSION

In light of the amendments and remarks herein,
Applicants submit that the claims are now in condition for
allowance and respectfully request a notice to this effect.
Should the Examiner have any questions, he is invited to call
the undersigned agent or Cathryn Campbell.

Respectfully submitted,

February 3, 2004
Date

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